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REMARKS/ARGUMENTS

Amendments were made to the specification to correct errors and to clarify the specification. No new matter has been added by any of the amendments to the specification.

Claims 1-8, 10-20, and 22-25 are pending in the present application. By this response, claims 1, 8, 10, 13, 20, 22, and 25 are amended and claims 9 and 21 are canceled. Claims 1, 13, and 25 are amended to clarify the subject matter that is being claimed and to incorporate the subject matter of claims 9 and 21. Support for the amendments may be found at least on page 30, lines 11-15 and in canceled claims 9 and 21. Claims 8 and 20 are amended in view of the amendments to claims 1 and 13 in order to provide proper antecedent basis. Claims 10 and 22 are amended to provide proper dependency. Reconsideration of the claims in view of the above amendments and the following remarks is respectfully requested.

I. Examiner Interview

Applicants thank Examiner Lai and Examiner Fleming for the courtesies extended to Applicants' representative during the June 29, 2006 telephone interview. During the interview, the objection to the drawings was discussed. Applicants' representative pointed to the location in the specification where element 260 was discussed. Also, during the interview, suggestions to amend the present application to overcome the 35 U.S.C. § 101 rejections were discussed. Claims 1, 13, and 25 are amended to incorporate subject matter similar to claims 9 and 21. Claim 13 is further amended to recite "A computer program product in a recordable-type computer readable medium..." The Examiners stated these amendments would overcome the 35 U.S.C. § 101 rejection. Also during the interview, proposed amendments to claims 1, 13, and 25 were discussed. Examiner Lai stated he would consider the proposed amendments. The substance of the interview is summarized in the remarks of sections that follow.

II. Drawings

The Office objects to the Drawings as including reference character(s) not mentioned in the description, specifically, element 260 of Figure 2. Applicants respectfully direct the Office to page 24, lines 12 and 15, and page 25, line 3 of the specification where element 260 is mentioned. In view of the above, Applicants respectfully request the objection to the Drawings be withdrawn.

III. 35 U.S.C. § 101

The Office rejects claims 1, 3, 7, 13, 15, 19, and 25 under 35 U.S.C. § 101 as being directed towards non-statutory subject matter. By this response, claims 1, 13, and 25 are amended to recite "wherein identifying a portion of code associated with the instruction as being a hot spot includes: generating, in the processor, an interrupt; and sending the interrupt to an interrupt handler of a performance monitoring application." Applicants respectfully submit that generating, in the processor, an interrupt; and sending the interrupt to an interrupt handler of a performance monitoring application, has a practical application and is in the technical arts. Since claims 3, 7, 15, and 19 depend from claims 1 and 13, Applicants respectfully submit these claims also have practical application and are in the technical arts. Therefore, Applicants submit that claims 1, 3, 7, 13, 15, 19, and 25 are statutory and Applicants respectfully request the withdrawal of the rejection of claims 1, 3, 7, 13, 15, 19, and 25 under 35 U.S.C. § 101.

The Office rejects claims 13-24 under 35 U.S.C. § 101 as being directed towards non-statutory subject matter. By this response, claim 13 is amended to recite "A computer program product in a recordable-type computer readable medium..." Therefore, Applicants respectfully submit that independent claim 13 is statutory. Thus, Applicants respectfully request withdrawal of the rejection of claims 13-20 and 22-24 under 35 U.S.C. § 101.

IV. 35 U.S.C. § 102, Alleged Anticipation

The Office rejects claims 1-25 under 35 U.S.C. § 102(b) as being anticipated by Burrows (U.S. Patent No. 5,887,159). This rejection is respectfully traversed.

As to claim 1, the Office states:

> As per claim 1, Burrows discloses a method in a data processing system for processing instructions, the method comprising:
> responsive to receiving an instruction at a processor in the data processing system (See column 2, lines 49-59: Instructions are fetched, decoded and executed), determining whether an indicator is associated with the instruction (See column 2 lines 59-65: This is done by checking to see if hint information is null or not);
> enabling counting, by the processor, of each event associated with execution of the instruction if the indicator is associated with the instruction (See figure 5 and column 5, lines 11-13: A count field is available for keeping track of the number of times a certain action occurs), wherein the processor autonomically increments the count of the events associated with execution of the instruction in a hardware counter (A counter inherently is able to increment a count when certain operations occurs);
> determining if the count of the events associated with the execution of the instruction stored in the hardware counter meets or exceeds a threshold (See column 5, lines 14-17: Counts are tracked and used to update hint information); and

identifying a portion of code associated with the instruction as being a hot spot if the count of the events associated with the execution of the instruction in the hardware counter meets or exceeds the threshold (See column 5, lines 29-30: The best_hint field indicates the current hot spot).

Office Action dated April 19, 2006, pages 4-5.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed Cir. 1990). All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed Cir. 1994). Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the reference broadly teaches. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). Applicants respectfully submit that Burrows does not teach every element of the claimed invention arranged as they are in the claims.

Amended claim 1, which is representative of the other rejected independent claims 13 and 25 with respect to similarly recited subject matter, reads as follows:

> 1. A method in a data processing system for processing instructions, the method comprising:
>
> responsive to receiving an instruction at a processor in the data processing system, determining whether an indicator is associated with the instruction, **wherein the indicator identifies the instruction as one that is to be monitored by a performance monitor unit;**
>
> enabling counting, by the processor, of each event associated with execution of the instruction if the indicator is associated with the instruction, wherein the processor autonomically increments the count of the events associated with execution of the instruction in a hardware counter;
>
> determining if the count of the events associated with the execution of the instruction stored in the hardware counter meets or exceeds a threshold; and
>
> **identifying a portion of code associated with the instruction as being a hot spot if the count of the events associated with the execution of the instruction in the hardware counter meets or exceeds the threshold**, wherein identifying a portion of code associated with the instruction as being a hot spot comprises:
>
> generating, in the processor, an interrupt; and
>
> sending the interrupt to an interrupt handler of a performance monitoring application. (emphasis added)

Applicants respectfully submit that Burrows does not teach every feature in amended claim 1 in the same arrangement as recited in claim 1. More specifically, Burrows does not teach responsive to receiving an instruction at a processor in the data processing system, determining whether an indicator is associated with the instruction, wherein the indicator identifies the instruction as one that is to be monitored by a performance monitor unit and identifying a portion of code associated with the instruction as being a hot

spot if the count of the events associated with the execution of the instruction in the hardware counter meets or exceeds the threshold.

Burrows is directed to locating hint fields embedded within instructions and replacing the hint fields with calls to intercept the execution flow and redirect to procedures of a monitor. During code execution, Burrows records the existing hint information in a memory and analyzes the hint information to determine the most frequently occurring or best hint value. When a best hint value has been determined, Burrows restores the replaced instructions with best hint values. (see Burrows, Abstract)

The Office alleges that Burrows teaches responsive to receiving an instruction at a processor in the data processing system, determining whether an indicator is associated with the instruction in the following section:

> FIG. 1 shows a process 100 which can be used for dynamically determining hint fields of instructions of machine executable code. A programmer generates, for example, object-oriented source programs 110 using conventional programming techniques. The source programs 110, once processed, are intended for execution in a computer system (CPU) 190. The programs 110 can be compiled by a compiler 111 into object code modules (obj) 120. The object code modules 120 include instructions with hint fields. Hint fields help branch prediction logic of the CPU 190 to determine the address of a next instruction to be fetched. Execution cycles are saved if the instructions are correctly fetched. Instructions whose destination addresses can only be resolved at run-time have their hint fields set to null.
>
> A monitor program 130 is also generated. The purpose of the monitor program 130 is to dynamically intercept the execution flow of the object modules 120 to record and analyze hint information.

(Burrows, column 2, lines 49-65)

In this section, Burrows describes determining which instructions have hint fields. The Office seems to equate Burrows' hint field to the presently claimed indicator. Burrows' hint fields are described as fields that help branch prediction logic of the CPU to determine the address of a next instruction to be fetched. Thus, Burrows' hint field specifies a likely target address. In contradistinction, the present invention provides an indicator that identifies the instruction as one that is to be monitored by a performance monitor unit. Therefore, Burrows does not teach determining whether an indicator is associated with the instruction in response to receiving an instruction at a processor in the data processing system, wherein the indicator identifies the instruction as one that is to be monitored by a performance monitor unit.

Additionally, Burrows does not teach identifying a portion of code associated with the instruction as being a hot spot if the count of the events associated with the execution of the instruction in the hardware counter meets or exceeds the threshold. The Office alleges that "The best_hint field indicates the current hot spot" and that the presently claimed feature is taught in the following section:

> The best-hint field 540 of the entry will be set to what the hint should be given the current execution context.

(Burrows, column 5, lines 29-30)

As discussed above, Burrows describes a hint field as fields that help branch prediction logic of the CPU to determine the address of a next instruction to be fetched. Thus, Burrows' hint field specifies a likely target address. Burrows further describes best hint fields as a most frequently occurring hint field (see Burrows, Abstract). Applicants have acknowledged in the Background of the present specification that a hot spot is commonly known in the computer arts as being a place in the code where time is being spent by the processor in executing code, see page 4, lines 19-23. One of ordinary skill in the art would not equate a likely target address (hint field) with a place in the code where time is being spent by the processor in executing code (hot spot). Thus, while Burrows may count the number of times a likely target address appears, replace the instructions with a most frequently occurring address, when the count reaches a threshold, and identify the most frequently occurring address as a best hint field, Burrows does not teach identifying a portion of code associated with the instruction as being a **hot spot** if the count of the events associated with the execution of the instruction in the hardware counter meets or exceeds the threshold.

Thus, Burrows does not teach each and every feature of independent claims 1, 13, and 25 as is required under 35 U.S.C. § 102. At least by virtue of their dependency on independent claims 1 and 13, the specific features of dependent claims 2-8, 10-12, 14-20, and 22-24 are not taught by Burrows. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1-8, 10-20, and 22-25 under 35 U.S.C. § 102.

Moreover, in addition to their dependency from independent claims 1 and 13, the specific features recited in dependent claims 2-8, 10-12, 14-20, and 22-24 are not taught by Burrows. For example, with regard to claims 5 and 17, Burrows does not teach wherein the indicator is a separate instruction. The Office alleges that this feature is taught in the following section and Figure:

> FIG. 2 shows one format of a "branch" type instruction 200. The instruction 200 includes an operator field (opcode) 210, and operand 220. The operator can be, for example, jump-to-subroutine (jsr) or branch-to-subroutine. The operand 220 can be used to specify a target address. The operand 220 can include, for example, two register fields Ra 221 and Rb 222, and a hint field 223.
>
> The hint field 223 can include two bits 224 and fourteen bits 225. The bits 224 indicate the opcode, e.g., 0=jmp, 1=jsr, 2=ret, and 3=jsr_coroutine. The opcode is used by the branch prediction logic to make PC and stack calculation. The bits 225 can store a displacement with respect to the current PC. The displacement can be resolved to an instruction cache block address which is passed to branch the prediction logic. It should be noted that the field 220 is nothing more than a hint. Therefore, correct setting of the bits can improve performance, but correct setting is not needed for correct operation. Executing the instruction 200 can cause the PC of the following instruction (jsr_PC) to

be written to register Ra 221. The target address specified in register Rb 222 becomes the new PC.

(Column 3, line 58, to column 4, line 11)

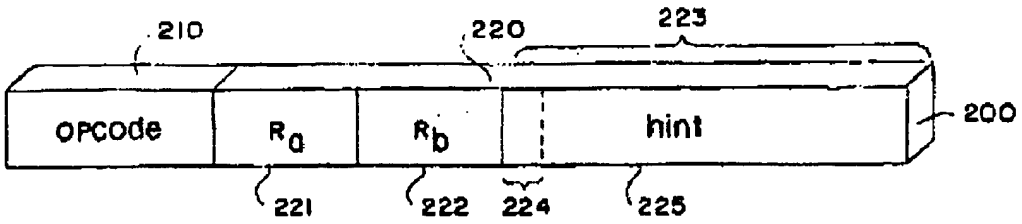

FIG.2

(Figure 2)

In this section and Figure, Burrows describes branch type instruction 200 that includes hint field 223. Thus, Burrows teaches that a hint field is part of an instruction and not a separate instruction.

Therefore, in addition to being dependent on independent claims 1 and 13, dependent claims 2-8, 10-12, 14-20, and 22-24 are also distinguishable over Burrows by virtue of the specific features recited in these claims. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 2-8, 10-12, 14-20, and 22-24 under 35 U.S.C. § 102.

Furthermore, Burrows does not teach, suggest or give any incentive to make the needed changes to reach the presently claimed invention. Absent the Office pointing out some teaching or incentive to implement Burrows such that a determination is made as to whether an indicator is associated with the instruction responsive to receiving an instruction at a processor in the data processing system, wherein the indicator identifies the instruction as one that is to be monitored by a performance monitor unit, and a portion of code associated with the instruction is identified as being a hot spot if the count of the events associated with the execution of the instruction in the hardware counter meets or exceeds the threshold, one of ordinary skill in the art would not be led to modify Burrows to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion or incentive to modify Burrows in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the Applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

V. Conclusion

It is respectfully urged that the subject application is patentable over the prior art of record and is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

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